Space Weather Forecast

Issued on Sunday, 13 November 2022 at 12:49 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Moderate class flares (Minor-Moderate radio blackouts) throughout.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity over the past 24 hours has reduced to Low. There was a period of more enhanced Common-class flare activity between 12/1400-2000 UTC, mainly from the largest region in the northwest quadrant. There are three other numbered regions on the visible disc, two in the northwest and one in the northeast. The unnumbered region approaching centre disc in the northeastern quadrant is small and simple at this time.

No Earth-directed Coronal Mass Ejections (CMEs) have been observed in available imagery

Solar Wind / Geomagnetic Activity: The solar wind saw a gradual, albeit erratic decrease during the period from around 460-500km/s, to around 430-460km/s, as the effects from a recent coronal hole high-speed stream started to wane. Magnetic field strength fluctuated moderately at first, before returning to weak levels, with the important north-south component showing a similar trend, with periodic fluctuations between positive and negative sectors. Geomagnetic activity was Quiet (Kp 0-2) throughout.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background levels with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to be generally Low, with a chance of isolated Moderate flare activity. The most likely source of activity is from the largest and most complex sunspot regions in the northwestern quadrant.

Solar Wind / Geomagnetic Activity: No Earth-directed CMEs are currently forecast. Although some faint ejecta, perhaps associated with occasional flare activity over the past couple of days, cannot completely be discounted as having some Earth directed trajectory. However, any potential impacts would be expected to be weak.

Solar winds are currently at slightly elevated levels, due to ongoing but waning coronal hole influence. Winds are expected to return towards slow-ambient levels over the next couple of days as these effects wane. Two small coronal holes in the western hemisphere will rotate into a potentially geoeffective position by day 3 (15 November), and may give a weak enhancement to solar winds, although confidence is low as these are not recurrent features. However, model forecasts do hint that this is a possibility.

Geomagnetic activity is expected to be predominantly Quiet to Unsettled through the period, perhaps with a slight chance of isolated Active intervals around day 3 (15 November).

Energetic Particles / Solar Radiation: The count rate of energetic particles (High energy protons) is forecast to persist at background levels. However, there is a very slight chance of an increase in solar radiation storms over normal conditions given the presence of two moderately large, complex sunspot regions in the western hemisphere.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	1	5	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	40	40	40	40
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	10	10
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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